

REMARKS

An excess claim fee payment letter is submitted herewith for four (4) excess claims.

Claims 1-24 are all the claims presently pending in the application. Claims 1-6 stand rejected on prior art grounds. Claims 7-24 have been added to claim additional features of the invention. Attached hereto is a marked-up version of the changes made to the claims by the current Amendment.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Regarding the prior art rejections, claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. (U.S. Patent No. 6,181,711) in view of Duault et al. (U.S. Patent No. 6,108,336) and Jones et al. (U.S. Patent No. 6,307,836). Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. in view of Duault et al. and Jones et al., and further in view of Rao (U.S. Patent No. 5,506,844). Claims 4-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. in view of Duault et al., Jones et al., Rao, and further in view of Fichou et al. (U.S. Patent No. 6,072,773).

The rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

The claimed invention, as defined, for example, by claim 1, is directed to a statistical

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multiplex transmission system for use in a network which includes a first local area ATM network having a plurality of first terminal devices, a second local area ATM network having a plurality of second terminal devices, and a public ATM network connected to the first and second ATM networks.

The invention includes a first multiplex gateway device for connecting the first local area ATM network and the public ATM network, and a second multiplex gateway device for connecting the second local area ATM network and the public ATM network. The first and second multiplex gateway devices receive ATM transmission signals from the first and second local area ATM networks, respectively. A statistical multiplexing process of the ATM transmission signals generates transmission statistical multiplex signals and transmits the signals to the public ATM network.

In the invention, the first and second multiplex gateway devices transmit the transmission statistical multiplex signals by a piece-wise constant bit rate transmission system, which has a piece-wise constant bit rate after the statistical multiplexing process, and which varies in a predetermined time interval.

Conventional image transmission terminals that transmit a variable bit rate image over ATM merely connect to an ATM network independently. Therefore, a statistical multiplex effect cannot be imparted to the image signal that is outputted from a conventional transmitter.

The claimed invention, on the other hand, provides a statistical multiplex transmission system that is capable of obtaining a statistical multiplex effect in an image transmission system having multiple terminals on both ends. The invention can acquire both statistical multiplexing gain and re-negotiation gain in comparison with discrete connections between

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individual terminals of the conventional system.

II. THE PRIOR ART REJECTIONS

THE ZHANG, DUAULT, AND JONES REFERENCES

The Examiner alleges that the claimed invention is unpatentable over Zhang in view of Duault, and Jones. Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by the Examiner's urged combination of references.

First, however, the Examiner has cited three references that, if combined, allegedly teach the claimed invention. Applicant respectfully submits that the Examiner has improperly combined the references and has failed to cite a proper motivation to combine to form the claimed invention.

First, the technology and techniques disclosed for Asynchronous Transfer Mode (ATM) networks in Zhang and Duault cannot be combined with a digital subscriber loop (DSL) in Jones.

Indeed, Jones addresses the problem where DSL lines support constant bit rate applications and prevents a subscriber from using adjustable bit rate applications (col. 3, lines 25-30). However, Jones does not disclose or suggest techniques for ATM networks.

Zhang's disclosure addresses the common problem of an Asynchronous Transfer Mode (ATM) network encountering data loss when inadequate bandwidth is available to transmit video bit streams. Zhang discloses that it is difficult to encode a video signal with a resulting bit rate profile tailored to the connection bandwidth available (Zhang, col. 3, line 59 - col.4, line 17). Zhang uses a statistical multiplexer and a communication channel with a

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plurality of bit rate converters, where each bit rate converter is coupled to receive a compressed bit stream and outputs a rate converted bit stream to the statistical multiplexer to provide rate converted bit streams (Zhang, col. 14, lines 58-65).

Duault's disclosure addresses a problem where ATM adaptation layers are implemented in different ATM equipment, which adds delay to network transmissions including real-time variable bit rate video and voice transmission applications (Duault, col. 5, lines 55-68).

Jones describes a communications network for a digital subscriber line (DSL), which is a far different technology than ATM (compare Jones, col. 2 with Duault, columns 1-5). A digital subscriber loop is the connection between an individual subscriber and a point of access (e.g., twisted pair or four wire telephone line) to a shared network (e.g., the Internet) (Jones, col. 2, lines 10-50). No person skilled in the art would consider combining, or even suggest the compatibility of DSL and ATM networks. It is well known that DSL and ATM networks require separate hardware and software systems and that it is necessary to perform conversions for data transmissions between the two formats.

The Examiner states that the urged combination is suggested by Jones' delivery of collective packetized signals to the transport network because this would increase economic benefits to customers. A combination of ATM network techniques is not suggested from increasing efficiency and economical viability for DSL customers. Again, these two approaches are incompatible. Thus, this is an improper basis for combining, and furthermore is nonsensical. No person skilled in the art would consider combining, or even suggest the compatibility of, DSL and ATM networks.

Further, while general "economic viability" and service to customers is an admirable

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goal for any business or enterprise, they are not stated advantages for the present invention, nor are they cited in the prior art references as a reason to combine. Therefore, the Examiner has not cited proper combinations or motivations to combine Zhang, Duault or for that matter, Jones.

Hence, it is clear that the urged combination is based on impermissible hindsight.

Further, even if the references were combined, they would not teach or suggest the claimed invention.

Zhang discloses a plurality of bit rate converters, a statistical multiplexer, and a communication channel (See Fig. 8). The statistical bit rate multiplexer combines three input bit streams into a single bit stream at its output (Zhang, col. 15, lines 1-4). The Examiner admits that Zhang does not "expressly disclose that the statistical multiplexer connects to an ATM network, nor does Zhang disclose that there are two statistical multiplexers, each connecting a different local area ATM network to a public ATM network [as described in claim 1]," (Office Action, p. 3). However, Applicant submits that Duault fails to make up for the deficiencies of Zhang.

The Examiner urges the combination of Figure 8 of Zhang, Figure 1 of Duault, and Jones. Duault describes a conventional local ATM network with single terminal stations connected to a public ATM network Duault and Zhang merely disclose conventional devices and systems, as described in the present Application, where ATM transmission is performed and image transmission means is known that connects a local area ATM network to a public ATM network (Application, p. 1).

However, the deficiencies identified concerning ITU-T recommendation H.310 (Broadband audiovisual communication systems and terminals) have not been solved until

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the present invention. The claimed invention receives a plurality of variable rate encoded application data streams and creates an efficient multi-channel transmission service using “said first and second multiplex gateway devices” to “receive transmission ATM signals from said first and second local area ATM networks,” and perform “a statistical multiplexing process of said transmission ATM signals to generate transmission statistical multiplex signals, and transmitting said transmission statistical multiplex signals to said public ATM network,” as described in claim 1 (emphasis Applicant’s).

Methods for preventing data loss and maximizing the use of channel bandwidth do not teach or suggest the claimed invention. Both Zhang and Duault disclose methods to prevent delay and data loss within ATM networks. It is the combination for connecting a plurality of image transmission terminals connected to a local, and subsequently public, ATM network, where the statistical multiplexing gain and re-negotiation gain are performed in comparison with singular channels from individual channels, that creates the non-obvious claimed invention.

Duault discloses connecting private and public ATM networks (col. 7, lines 32-35; Fig. 1). Duault’s invention relates to a method for transmitting a constant bit rate or variable bit rate traffic in a streaming mode using functions of the ATM Adaptation Layer 5 (AAL-5) Common Part Convergence Sublayer (CPCS), in an Asynchronous Transfer Mode (ATM) network (col. 6, lines 6-12). A preferred embodiment of the claimed invention describes sending audio through a speech signal encoding/decoding unit 15 and video signals through an image signal coding/decoding unit to a statistical multiplexer 16 (Application, p. 6, lines 10-25). The signals are then transmitted to a B-ISDN public ATM network after statistical multiplexing (Application, p.5, lines 10-15).

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Although Zhang uses a statistical multiplexer in his disclosure, combining the multiplexer of Zhang with Duault would not teach or suggest the claimed invention. The claimed invention does not disclose techniques for AAL-5. Neither Zhang nor Duault teach or suggest sending multiplexed, much more statistically multiplexed, ATM signals from a private to public ATM network. Duault actually discloses very specific methods for using an AAL-5 for defining an AAL-5 SSCS for performing AAL-1 and AAL-2 functions in an ATM network (Duault, Abstract). As stated by Duault (regarding just anyone attempting to interface with an ATM network), “[i]n either case, a significant amount of logic is required over an above what is provided by ATM in order to use the network productively,” (col. 8, lines 9-12) (emphasis Applicant’s). Therefore, the combination of an ATM statistical multiplexer is not provided in Duault, and a significant amount of logic, over and above even a direct ATM network connection would at least be required prior to using Duault’s ATM network with any effectiveness.

Thus, claim 1, taken as a whole, is neither taught nor suggested by the urged combination. Turning to the exemplary language of claim 1, there is no teaching or suggestion of “[a] statistical multiplex transmission system for use in a network which includes a first local area ATM network having a plurality of first terminal devices, a second local area ATM network having a plurality of second terminal devices, and a public ATM network connected to said first and second ATM networks, comprising:

a first multiplex gateway device for connecting said first local area ATM network and said public ATM network; and

a second multiplex gateway device for connecting said second local area ATM network and said public ATM network,

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wherein said first and second multiplex gateway devices receive transmission ATM signals from said first and second local area ATM networks, respectively, and performing a statistical multiplexing process of said transmission ATM signals to generate transmission statistical multiplex signals, and transmitting said transmission statistical multiplex signals to said public ATM network,” (emphasis Applicant’s).

THE RAO AND FICHOU REFERENCES

First, neither Rao nor Fichou would have been combined with a reference for a DSL subscriber line as disclosed in Jones. Therefore, the Examiner’s urged combinations of the above-cited references with either Rao and/or Fichou are improper.

Regarding the Examiner’s rejection of claims 2 and 3, Rao discloses a method for configuring a statistical multiplexer that dynamically adjusts the data compression rate for each variable rate application over a selected interval of time (a window) so that the quality of the encoded data streams is maximized over the selected time interval (col. 6, lines 40-48). Rao’s method dynamically distributes the total capacity of a communication channel among a plurality of data streams that compete for access, without exceeding the capacity, and changes the fraction of channel capacity for each data stream in real time to as to maximize the quality of the signals for all the data streams in all channels (col. 2, lines 25-40).

It would not have been obvious to combine Rao with Zhang and Duault because, like Jones, Rao discloses a technique for use with a packet-switched network, not a disclosure for use with an ATM network. Rao discloses “adjusting . . . a number of packets” (col. 3, line 36), “a packet schedule table” (col. 9, line 9), and “the allocation of packets is such that the packets belonging to any one application are approximately uniformly spread over the time

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interval” (col. 9, lines 12-15). Obviously, this is not a disclosure for an ATM network.

Regarding claim 2, the Examiner asserts that Rao discloses a statistical multiplexing system that dynamically adjusts the data compression for each input variable rate application in a time window and selects packets for encoders to transmit the packet data on a channel.

However, the Examiner fails to explain why encoding the application data at a statistical multiplexer by Rao or adjusting a data compression rate for each incoming application would be combined with techniques for bit rate conversion as described by Zhang (compare Zhang, col. 14, lines 55-68 with Rao, col. 6, line 40 to col. 7, line 12). One skilled in the art would not combine such diverse techniques, and therefore would not combine Rao with Zhang.

Given these disparate objects, problems allegedly solved, and the unusual solutions offered, the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged. The Examiner has failed to disclose a teaching or suggestion in the prior art for the claimed invention.

The cited references, some of which are not for ATM networks, do not themselves suggest the desirability, and thus the obviousness, of making the combination, independent of the present invention and a thorough reading of Applicant’s own specification. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. Certainly, no person of ordinary skill in the art would consider combining such divergent references, absent hindsight.

The Examiner alleges Zhang, in view of Duault and Jones, teaches the limitations of claim 2 except that statistical multiplexers output a piece-wise bit rate transmission.

However, Rao fails to make up for these deficiencies. Rao discloses a different technique for

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transmitting data than the claimed invention. Rao selects encoded packets from application data streams, places them into a memory table, and then steps through the table to adjust the data compression rates for the packets for each application stream. Controller 310 analyzes the collected data and adjusts the compression rate for each variable encoder 302-i to maximize the quality for all encoders (Rao, col. 6, lines 65-68). Rao transmits the new data rates to encoders for transmission to the channels (col. 7., lines 4-5). This is a very different technique than adjusting bit rates for cells in an ATM transmission system. The claimed invention does not use encoders to re-encode each application data stream.

Thus, there is no teaching or suggestion by Rao of the claimed system where *“first and second multiplex gateway devices transmit said transmission statistical multiplex signals by a piece-wise constant bit rate transmission system having transmission rate after statistical multiplexing process which varies in a predetermined time interval,”* as recited in claim 2.

Regarding claim 3, the Examiner alleges the combination of Zhang, Duault, and Jones, in further view of column 9, lines 9-21 of Rao, teaches the claimed invention of receiving transmission statistical multiplex signals, separating the transmission statistical multiplex signals, and generating a plurality of receiving ATM signals to transmit to local terminals. However, Rao fails to teach any of these techniques and does not make up for the deficiencies of the combination.

Although the Examiner states that Rao is useful for demultiplexing of received streams (Office Action, p. 5) this does not teach or suggest the claimed invention. Indeed, Rao’s packet schedule table, as described above, is for compressing and re-encoding packet data. This has little, if any, relevance to statistically demultiplexing ATM cells over a

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channel.

Therefore, there is no teaching or suggestion of “[a] *statistical multiplex transmission . . . wherein said first and second multiplex gateway devices receive said transmission statistical multiplex signals to separate said transmission statistical multiplex signals, and generate a plurality of receiving ATM signals, and said first and second multiplex gateway devices transmit said receiving ATM signals to said first and second terminal devices through said first and second local area ATM networks, respectively,*” as recited in claim 3 (emphasis Applicant’s)

Regarding the Examiner’s rejection to claims 4, 5, and 6, the Examiner further alleges the urged combination, in further view of Fichou, teaches the claimed invention. However, as described above, Fichou merely discloses ATM cell rate measuring standards for ATM network transmissions, such as peak cell rate. Fichou clearly fails to make up for the deficiencies Rao and the combination of references.

Further, as described above, the Examiner is respectfully incorrect in alleging that the encoder and compression techniques of Rao teach or suggest present claims 4-6. As the Examiner stated, Rao’s controller (310) analyzes the data and adjusts the compression rate for each variable encoder, as well as re-encodes the selected packets from the data streams (see Rao, above). This is a different technique, utilizing packets and encoders, to transmit data in a packet-switched network, than the claimed invention. The claimed invention utilizes ATM cells and a controller to adjust piece-wise constant bit stream rates of data transmission over ATM.

Certainly, there is no teaching or suggestion in Fichou and Rao of a “*first means for calculating statistical information represented by a mean rate and a peak cell rate of ATM*

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cells,” a “second means for performing a multiplexing processing of said ATM cells according to said statistical information, and for transmitting said transmission statistical multiplex signals to said public ATM network,” a “third means for conducting rate addition after statistical multiplexing according to said statistical information,” a “fourth means for calculating a required piece-wise constant bit rate on the basis of said rate addition result, and for performing cell multiplex control on the basis of said piece-wise constant bit rate; and fifth means for transmitting said transmission statistical multiplex signal according to said cell multiplex control,” as described in claims 4-6 (emphasis Applicants).

For at least the reasons stated above, Applicant respectfully submits that the urged combination fails to teach or suggest every feature of claim 1 and claims 2-6, which depend from claim 1. Therefore claims 1-6 are fully patentable over the cited references.

Based on the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

III. FORMAL MATTERS AND CONCLUSION

In the Specification, the Abstract was amended to overcome informalities.

With respect to the Examiner's Communication, dated March 3, 2003 and the Examiner's failure to consider the references cited in the IDS filed on July 24, 2002 (with certification), the Examiner is respectfully requested to consider to the extent possible and to make of record the Japanese references submitted in the IDS and listed on the PTO-1449 form. Applicant notes that, for some reason, the Examiner crossed-out the Japanese references listed on the PTO-1449 Form returned with the Examiner's Communication dated March 3, 2003.

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However, Applicant fully complied with M.P.E.P. §609 and 37 C.F.R. §§1.97-1.99 regarding the submission of foreign language documents.

Regarding the July 24, 2002, IDS, it was noted in the IDS that the reference was cited in a Japanese Office Action in the counterpart application. In full compliance with M.P.E.P. §609 and 37 C.F.R. §§1.97-1.99, a translation of the relevant portions indicating the degree of relevance of the foreign reference cited in the foreign Action/Search Report was in fact submitted. Again, this is in full compliance with M.P.E.P. §609 (e.g., see right-hand column of page 600-122, of Original Eighth Edition, dated August 2001) and 37 C.F.R. §§1.97-1.99. Further, Applicant notes that there is no requirement in 37 C.F.R. or the M.P.E.P. for a "complete English translation" of a foreign language reference in order for the Examiner to consider the reference.

Hence, the Examiner is requested to consider and initial the PTO-1449 Form listing the reference. For the Examiner's convenience, a duplicate copy of the PTO-1449 Form is submitted herewith.

In view of the foregoing, Applicant submits that claims 1-24, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

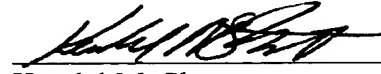
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The Commissioner is hereby authorized to charge any deficiency in fees, or to credit any overpayment in fees, to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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